

## CLAIMS

What is claimed is:

- 5     1.     A method for processing a circuit board, the method comprising:  
            placing a mask layer on the circuit board, the mask layer defining a set of  
            pad profiles for a component mounting location, each pad profile of the set of pad  
            profiles having a set of rounded corners;  
            forming, for each pad profile of the set of pad profiles, a soldering pad  
10           having a set of radii corresponding to the set of rounded corners of that pad profile  
            to create a set of soldering pads for the component mounting location, each  
            soldering pad having the set of radii being configured for a high bond strength  
            solder joint; and  
            removing the mask layer from the circuit board.
- 15     2.     The method of claim 1 wherein each pad profile of the set of pad profiles has  
            multiple rounded corners; and wherein placing the mask layer on the circuit board  
            includes:  
            configuring masking material over the circuit board, the configured  
20           masking material defining, for the multiple rounded corners of each pad profile of  
            the set of pad profiles, curved mask edges having radii in a range between 8 mils  
            and 12 mils.
- 25     3.     The method of claim 1 wherein forming, for each pad profile of the set of pad  
            profiles, the soldering pad having the set of radii includes:  
            etching, as the soldering pad, a surface mount contact having an outer  
            periphery in which every intersection between two substantially straight peripheral  
            edges of the outer periphery has a radius of at least 8 mils.

4. The method of claim 1, further comprising:

after removing the mask layer from the circuit board, printing solder paste on a top surface of each soldering pad of the set of soldering pads while leaving a periphery of the top surface of each soldering pad of the set of soldering pads

5 exposed;

placing a circuit board component in contact with the printed solder paste; and

applying heat to solder the circuit board component to the set of soldering pads using the printed solder paste.

10

5. The method of claim 4 wherein the solder paste substantially consists of flux and lead-free solder, and wherein printing the solder paste includes:

depositing the solder paste substantially consisting of the flux and the lead-free solder over the set of soldering pads.

15

6. The method of claim 1 wherein placing the mask layer on the circuit board includes:

configuring masking material over the circuit board, the configured masking material defining, for each pad profile of the set of pad profiles, a set of inward blended curves to define a trace attachment point for a circuit board pad corresponding to that pad profile, each inward blended curve having a radius in a range between 8 mils and 12 mils.

20

7. The method of claim 1 wherein forming, for each pad profile of the set of pad profiles, the soldering pad includes:

25

etching, as the soldering pad, a surface mount contact that defines a substantially oval shape.

8. The method of claim 1 wherein forming, for each pad profile of the set of pad profiles, the soldering pad includes:  
etching, as the soldering pad, a surface mount contact having a main portion, and multiple convex lobes integrated with the main portion.
- 5
9. The method of claim 1 wherein forming includes:  
etching, for each pad profile of the set of pad profiles, a surface mount contact that is substantially free of angled radii sharper than 8 mils.
- 10
10. A circuit board processed by a method, the method comprising:  
placing a mask layer on the circuit board, the mask layer defining a set of pad profiles for a component mounting location, each pad profile of the set of pad profiles having a set of rounded corners;  
forming, for each pad profile of the set of pad profiles, a soldering pad  
15 having a set of radii corresponding to the set of rounded corners of that pad profile to create a set of soldering pads for the component mounting location, each soldering pad having the set of radii being configured for a high bond strength solder joint; and  
removing the mask layer from the circuit board.
- 20
11. The circuit board of claim 10 wherein each pad profile of the set of pad profiles has multiple rounded corners; and wherein placing the mask layer on the circuit board includes:  
configuring masking material over the circuit board, the configured  
25 masking material defining, for the multiple rounded corners of each pad profile of the set of pad profiles, curved mask edges having radii in a range between 8 mils and 12 mils.

12. The circuit board of claim 10 wherein forming, for each pad profile of the set of pad profiles, the soldering pad having the set of radii includes:  
etching, as the soldering pad, a surface mount contact having an outer periphery in which every intersection between two substantially straight peripheral edges of the outer periphery has a radius of at least 8 mils.
- 5
13. The circuit board of claim 10 wherein the method further comprises:  
after removing the mask layer from the circuit board, printing solder paste on a top surface of each soldering pad of the set of soldering pads while leaving a periphery of the top surface of each soldering pad of the set of soldering pads exposed;  
placing a circuit board component in contact with the printed solder paste;  
and  
applying heat to solder the circuit board component to the set of soldering pads using the printed solder paste.
- 10
- 15
14. The circuit board of claim 13 wherein the solder paste substantially consists of flux and lead-free solder, and wherein printing the solder paste includes:  
depositing the solder paste substantially consisting of the flux and the lead-free solder over the set of soldering pads.
- 20
15. The circuit board of claim 10 wherein placing the mask layer on the circuit board includes:  
configuring masking material over the circuit board, the configured masking material defining, for each pad profile of the set of pad profiles, a set of inward blended curves to define a trace attachment point for a circuit board pad corresponding to that pad profile, each inward blended curve having a radius in a range between 8 mils and 12 mils.
- 25

16. The circuit board of claim 10 wherein forming, for each pad profile of the set of pad profiles, the soldering pad includes:  
etching, as the soldering pad, a surface mount contact that defines a substantially oval shape.
17. The circuit board of claim 10 wherein forming, for each pad profile of the set of pad profiles, the soldering pad includes:  
etching, as the soldering pad, a surface mount contact having a main portion, and multiple convex lobes integrated with the main portion.
18. The circuit board of claim 10 wherein forming includes:  
etching, for each pad profile of the set of pad profiles, a surface mount contact that is substantially free of angled radii sharper than 8 mils.
19. A circuit board, comprising:  
a rigid planar-shaped member; and  
a component mounting location disposed on the rigid planar-shaped member, the component mounting location including soldering pads having rounded corners, each rounded corner having a radius greater than 8 mils for high solder joint bond strength.
20. The circuit board of claim 19, further comprising:  
a circuit board component; and  
solder joints that mount the circuit board component to the component mounting location, each solder joint resulting from solder paste printed on a top surface of a soldering pad while leaving a periphery of the top surface of that soldering pad exposed.

21. The circuit board of claim 19, further comprising:  
a circuit board component; and  
solder joints that mount the circuit board component to the component  
5 mounting location, each solder joint substantially consisting of lead-free solder.
22. The circuit board of claim 19, further comprising:  
surface traces that connect to the soldering pads at attachment points  
having inwardly blended curves, each inward blended curve having a radius that is  
10 greater than 8 mils.
23. The circuit board of claim 19 wherein each soldering pad has a profile which is  
substantially oval in shape.
- 15 24. The circuit board of claim 19 wherein each soldering pad includes a main portion,  
and multiple convex lobes integrated with the main portion.
25. The circuit board of claim 19 wherein each soldering pad is substantially free of  
angled radii sharper than 8 mils.
- 20 26. A method for processing a circuit board, the method comprising:  
providing a circuit board;  
forming a set of pads on the circuit board; and  
placing a solder mask layer over the formed set of pads, the solder mask  
25 defining a set of solder apertures for the set of pads, each solder aperture of the set  
of solder apertures having a set of rounded corners configured for a high bond  
strength solder joint.

27. The method of claim 26 wherein each pad is solder mask defined and has at least one solder mask defined straight edge and at least two solder mask defined radii, and wherein placing the solder mask layer includes:  
providing solder mask material that defines, as the radii, rounded corners  
5 substantially in a range between 8 mils and 12 mils.
28. The method of claim 26, further comprising:  
printing solder paste substantially consisting of flux and substantially  
lead-free solder over the set of pads; and  
10 soldering a component to the set of pads using the printed solder paste.
29. A circuit board processed by a method, the method comprising:  
forming a set of pads on the circuit board; and  
placing a solder mask layer over the formed set of pads, the solder mask  
15 defining a set of solder apertures for the set of pads, each solder aperture of the set of solder apertures having a set of rounded corners configured for a high bond strength solder joint.
30. The circuit board of claim 29 wherein each pad is solder mask defined and has at least one solder mask defined straight edge and at least two solder mask defined radii, and wherein placing the solder mask layer includes:  
20 providing solder mask material that defines, as the radii, rounded corners substantially in a range between 8 mils and 12 mils.
31. The circuit board of claim 30 wherein the method further comprises:  
printing solder paste substantially consisting of flux and substantially  
lead-free solder over the set of pads; and  
25 soldering a component to the set of pads using the printed solder paste.

32. The circuit board of claim 30 wherein the solder mask overlaps each pad of the set of pads by at least 6 mils when defining the solder apertures having the rounded corners.